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Technology Left Behind -- GIS amd the Library: Part 1

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processes and policies. Establishing a standard that encompasses, in detail, every stage and every variant of an article along with relevant identifiers seemed from the perspective of the Working Group to be unnecessarily broad and unlikely to achieve the desired result. The committee set about its work focusing on the key stages of the publication process, which would cover the vast majority of publishers' workflows.

The process of producing a published article is an iterative, developmental process, in which value is added through each passing stage. And yet, within this iterative development, there are important variations in key attributes that may not affect the content so much as its presentation. Articulated by **Evan Owens**, Chief Technology Officer at **Portico**, there exists a vertical versus horizontal set of relationships in variations of an article. While some stages can been seen from a developmental perspective, with significant variation from "generation" to "generation", there are also horizontal variations in versions where presentation issues such as format, location, print/electronic produce "sibling" versions.

The direction of the Working Group has been predicated on some basic assumptions. Among these is that an article passes through many steps toward publication and that each of these important steps adds value to the end product of the article. While a step could be repeated on several occasions, one step is completed before the article moves onto the next step. Rather than summarizing each variant of each possible step, the goal was to lay forward a summary of the process that detailed the key stages in most of the community. Rather than pursuing a solution that would fit every detail of every stage for every publisher, the committee sought to find a solution that addressed the most common cases in hopes of simplifying the current discussion. Adding a common terminology will help draw out key distinctions and improve understanding among researchers and students about the version a user might be viewing.

The committee has worked diligently to review a number of use studies of various publication processes. Having reached consensus internally, the group sent out the draft to the Review Committee and is in the process of compiling and responding to the various comments that were received. The brief description that follows is a summary of the current draft of the proposed terminology. It may yet be revised again prior to public comment or before final adoption by the **NISO** community.

For complete background, details and definitions, please review the work of the committee at the **NISO** Website. The direct link to the **JAV Working Group**'s documentation is at: *http://www.niso.org/committees/Journal_versioning/JournalVer_comm.html*. In its present draft form, the Working Group has proposed a streamline terminology of the five key steps in the publication process. It includes the following stages:

- "Author's Original"
- "Accepted Manuscript"
- "Proof"
- "Version of Record"
- "Updated Version of Record"

Quoting from the draft report: "Each term identifies a significant value-added "state change" in the progress of a journal article from origination to publication. Three of the versions (Author's Original; Proof; Updated Version of Record) may have a number of iterative stages. [The Working Group has] not attempted to identify these stages, although date stamps, version numbers and metadata records may be use to differentiate them. Two of the versions (Accepted Manuscript; Version of Record) represent fixed stages. An Author's Original that is accepted for publication becomes an Accepted Manuscript at the point of acceptance. A Proof that is corrected and published becomes a Version of Record."

The first step covers the author's submission for publication. An Author's Original is the version of a journal article that is considered by the author(s) to be of sufficient quality to be submitted for review by a second party. The author accepts full responsibility for the article, setting both content and format.

Once the article is accepted for publication, the journal enters the first fixed state in the process, the Accepted Manuscript version. At this stage, the publisher takes responsibility for the article, although the content and layout remain as submitted by the author.

During production at the publisher, the article is defined as being in the "Proof" stage. Again, this may encompass a number of versions as the article is revised via both substantive and copy editing, typesetting files (i.e., galley proofs), page proofs and revised proofs. While the author may be involved in the revision of the Proof, primary responsibility for the changes made during this stage lies with the publisher. Although Proof stage versions are generally regarded as "internal process" stage documents, it is acknowledged that some of the iterative versions prior to the Version of Record may be distributed in some format, either accidentally or by design.

Once the article is declared "fit for publication" and released to the public by an organization acting as a publisher, the article becomes the "Version of Record", the second fixed state in the process. This stage may include articles published as "early release" articles, so long as they are formally identified as "published". This is the formally recognized, authorized and definitive version of the article. After publication any subsequent amendment to the article would be considered an "Updated Version of Record".

The Working Group released a version of the terminology in April 2006 to the Review Committee for comment and review. While there is broad consensus about the approach, some of the details that remain are associated with the terminology, such as "adds value" as well as the concepts of "functionality" and "location." These issues are under review by the Working Group and will be considered for inclusion in the final version proposed for adoption. The goal of the Group is to have a final draft available for public review in early 2007.

Additional documentation and complete details of the committees work are available at: *www.niso.org*.

Technology Left Behind — GIS and the Library: Part 1

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*Column Editor's Note: This column will be the first installment in a two part discussion of **Geographic Information Systems (GIS)** services. In this first part, **GIS** services are defined and the ways in which libraries can provide **GIS** services to patrons are discussed, briefly touching on issues of software and data sources. The second part of the discussion, which will appear in the February 2007 issue of **ATG** will highlight some of the innovative ways that libraries are using **GIS** to enhance their own services. —**CF***

Definition and Examples of GIS

Geographic Information Systems allow users to layer and integrate varying types of data together with the graphic features of a map.[1] "This layering capability provides users the opportunity to view data graphically or spatially rather than in tabular form."[2]

A **GIS** computer system is typically made up of hardware, software, and data, working together in the layering process.[3] In terms of hardware, it is helpful to have a computer

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with a large amount of memory, a large screen monitor to more easily see detailed maps, and, possibly, a large-format printer to output the maps.[4] Utilizing a **GIS** software package offline, users create their own **GIS** by uploading maps to the software and overlaying their own data elements over those maps.

GIS implementations are most often specific to a user's own specific research interests and assignments. For example, a user at **Furman University** (my own institution), interested in a possible correlation between the concentration of fast food restaurants and the levels of obesity in the population, uploaded tables of data on obesity into the **GIS** software along with the longitude and latitude of various fast food restaurants. He could then display both factors on the map to visualize any possible correlation.

Once a **GIS** system is built, it can be made available via the Web. A Web-based **GIS** service allows users a high degree of interactivity with both map and data, giving them the ability to select which data elements to display, either individually or simultaneously. The **National Park Service (NPS) Interactive Map Center** is one such example. Users can view maps of all of the National Parks in the United States and its territories, and display and manipulate layers of data on the maps, including data elements such as major highways, rivers, bodies of water, and hiking trails. The drawback to a Web-based **GIS** system, such as the **NPS Interactive Map Center**, is that it only displays the data elements that are built into it; users can not add their own data elements to the system.

The **Southern History Database** at **Furman**, coordinated by **Lloyd Benson**, a professor in **Furman**'s History Department, provides an example of a Web-based, editable **GIS**. For this project, students in an 1820-1890 History course are asked to investigate primary sources to identify events important to this time period. They enter the date, location (latitude and longitude), and significance of those events into an HTML form, which drops the data into a mySQL database. The scripts behind the database translate the HTML form data into coordinates and then plot those coordinates over a pre-generated map, allowing students to visualize the location of events and how they relate to each other, thus, creating an interactive, geographically aware, user-defined timeline and mapping tool/encyclopedia. This particular project was modeled on a similar effort, the **Southern History Database**, at the **University of Virginia**. (To view the **Southern History Database** at **Furman**, please contact **Lloyd Benson** at <lloyd.benson@furman.edu>.)

GIS services are a growing area of interest and involvement for libraries. Many libraries are already providing linking to freely available Web-based **GIS** services to some degree. Providing the facilities for users to build their own **GIS** requires a greater commitment, including access to **GIS** software, geo-referenced spatial files (maps), and geographic data sources. The remainder of this column identifies ways that libraries are providing some degree of **GIS** services to their users.

GIS in the Library

"The availability of **GIS** in libraries is relatively limited and does involve some specialized knowledge, but it is increasing in all types of institutions."[5] In Fall 2002, **Kinikin** and **Hench** conducted a survey of 268 libraries to investigate the implementation and use of **GIS** in smaller academic libraries. Of the 138 libraries that responded to the survey, 22 indicated that they were providing **GIS** services, and 27 indicated that they planned to adopt the technology in the near future.

Just as there are different levels of **GIS** services, **Kinikin** and **Hench** determined from the survey responses that the degree to which a library chooses to support a **GIS** service also varies. In terms of staffing **GIS** services, at some libraries one or more full time employees assisted patrons with **GIS** in addition to their regular duties, while at others **GIS** staffing fell to part-time employees or student workers. Regarding the level of service provided to patrons, some libraries indicated that they provide a high degree of service, creating maps at a user's request or acting as a clearinghouse for geospatial information. However, the majority of libraries indicated that "'users with some knowledge of **GIS** are given open access to a computer loaded with **GIS** software.'"[6] The majority of the respondents also indicated that training to use **GIS** software and services is not available in the library, although such training may be available elsewhere on campus.

GIS services at the **Furman University** Libraries are relatively simple, falling toward the lower end of the staffing, training, and services spectrum. The library's **GIS** services support **GIS** projects and assignments in courses offered by the Economics, Earth and Environmental Sciences (EES), History, and Health and Exercise Science Departments. Training on how to use the **GIS** software is provided by the faculty in those academic departments. The library provides students and faculty access to the software on computers throughout the library, including computers in the library's 24 hours study lounge, and the Science Librarian, who has had some training on **GIS** software, is available as a resource to those students requiring assistance. **Furman** began providing this service at the request of the EES department, so that students working on **GIS** projects would have access to the necessary software when the EES computer lab was closed. However, the service has proved popular with other departments working with **GIS** as well. The library works with professors to obtain access to datasets and sources that would be useful for **GIS** users.

On the opposite end of the spectrum, the **Branner Earth Sciences Library** at **Stanford University** provides a more structured and enhanced level of service for its **GIS** users. The **Geographic Information Systems** Web page on the **Branner Library** site highlights the library's **GIS** services, providing access to **GIS** software (available for download to **Stanford University** users), data sources, and Web-based **GIS** training. **Branner** has a dedicated, staffed **GIS** facility housed in the library, where users can receive reference help and research consultation.

GIS services at **Weber State University (WSU)** are attempting to bridge the gap between services like **Furman**'s and services like **Branner**'s. In 2003, **WSU** purchased **GIS** software and loaded it on a single computer station in the reference area with the future goal of setting up a dedicated **GIS** lab in the library. With the help of **Higher Educational Technology Initiative (HETI)** grant, two librarians received **GIS** training through an online course offered by the **Environmental Systems Research Institute (ESRI)**. Since that time, there has been a concerted effort to improve **GIS** usage across the **WSU** campus through workshops given to faculty in a variety of disciplines, including business and nursing. A **Library Services and Technolgoy Act (LSTA)** grant enabled **WSU** to purchase two additional computers for the **GIS** lab, and outreach is ongoing.[7]

GIS Software and Data Sources

There are a number of **GIS** software programs available. The most common software providers and packages, mentioned in the **Kinikin** and **Hench** survey and on the **Branner Library GIS** page, include **ESRI**, **MapInfo**, **IDRISI/ERDAS**, **MapPoint**, **Smallworld**, and more. The **Kinikin** and **Hench** survey indicated that most **GIS** software in libraries is loaded on individual computers, although a few institutions indicated that they load the software on a server.

The most widely used piece of software in the **Kinikin** and **Hench** survey was **ArcView**, produced by **ESRI**, which also happens to be the **GIS** software that **Furman University** has licensed. Because the **GIS** services and software are used by a variety of disciplines at **Furman**, the cost of the software and the concurrent user license is split across three departments, Economics, Earth and Environmental Sciences, and the library. The **Branner Library** at **Stanford** has also licensed the **ESRI** software products for its users.

GIS data can come from a wide variety of sources, many of them freely available online. "The Internet is invaluable as a source of data for **GIS** users; online files, with standardized data, may be located and downloaded for incorporation and manipulation with **GIS** software off-line."[8] In recent years, collaboration and sharing within the field of geographic information services has lead to a proliferation of

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meta search engines or clearinghouses of geospatial databases, one of the most well-known examples being the **Geography Network** by **ESRI**.[9] In addition to clearinghouses, maps and datasets from federal, state, and local governments are also often freely available online. For example, in the state of South Carolina **GIS** data is available from both the **Department of Natural Resources** and the **Office of Research and Statistics** on the state level and from the **Geographic Information Systems** Division of Greenville County on a local level.

While most **GIS** services rely heavily on datasets that can be loaded directly into the software, almost anything can be a data source for a **GIS**. In addition to the freely available datasets, many of a library's subscription resources are valuable data sources for **GIS** services. For example, **ReferenceUSA** provides the longitude and latitude of many businesses, which could be entered into a **GIS** to plot business locations on an interactive map. In the History course project described above, students were looking at primary sources to obtain data to enter into their class **GIS**. Historic maps from the library's collection may be geo-referenced to current maps and overlaid for comparative study.

Challenges

It is clear that there are benefits to coordinating some level of **GIS** services in the library. "Libraries at smaller colleges and universities tend to be a focal point for students, faculty, and the community, making them appropriate places to conduct **GIS** research."[10]

It is also clear that the success or failure of **GIS** services in libraries is contingent upon a variety of factors, including funding, training and promotion. While it does not take much to get involved in providing **GIS** services (a dedicated computer, a **GIS** software package, and data sources), providing a higher level of service can get expensive. **Weber State University** has had to seek grants and other outside sources of funding to be able to consistently fund and improve its **GIS** lab. Training also proves to be a challenge. **GIS** services are not self-explanatory, and few librarians at a given institution are typically able to use or to teach others how to use **GIS** software. An investment of time and resources will have to be made to get librarians trained to provide effective **GIS** services. Lastly, no matter how extensive the **GIS** services you provide, if no one comes into the library to use them, they are not worth the investment. Whether the impetus for setting up a **GIS** service comes from academic departments outside the library or if you are setting up a **GIS** service in the library with the express intention of promoting **GIS** services to your user community, it is necessary to actively advertise whatever services you do offer and get other people involved in that promotion.

For further information on **Geographic Information Systems** and to see examples of **GIS**, please take a look at the Web resources below, most of which have been referenced in this column. In addition, the Fall 2006 issue of *Library Trends* is devoted to the topic of **GIS** and libraries, covering the topic from a variety of angles.

Tune in next issue when this column will highlight some of the ways libraries are using **GIS** to enhance their own services.

GIS Web Resources

ArcView — *http://www.ESRI.com/software/arcgis/arcview/index.html*

ESRI — *http://www.ESRI.com/*

Geographic Information Systems at **Branner Library, Stanford University** — *http://www-sul.stanford.edu/depts/gis/*

Geography Network — *http://www.geographynetwork.com/*

GIS.com — *http://www.gis.com/*

GRASS — http://grass.itc.it/

Greenville County Geographic Information Systems Division — *http://www.gcgis.org/*

IDRISI — *http://www.clarklabs.org/*

MapInfo — *http://www.mapinfo.com/*

MapPoint — *http://www.microsoft.com/mappoint/default.mspx*

National Park Service's Interactive Map Center — *http://maps2.itc.nps.gov/nps/parkatlas/jsp/atlas.jsp*

Smallworld — *http://www.gepower.com/prod_serv/products/gis_software/en/index.htm*

South Carolina Department of Natural Resources — *http://www.dnr.sc.gov/gis.html*

South Carolina Office of Research and Statistics — *http://www.ors.state.sc.us/digital/digital.asp*

Southern History Database — *http://www.vcdh.virginia.edu/SHD/*

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Endnotes

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4. **Shaun Speigel** and **JaNae Kinikin**, "Promoting Geographic Information System Usage Across Campus," *Computers in Libraries* 23, no. 5 (May 2005): *http://www.infotoday.com/cilmag/may04/spiegel_kinikin.shtml.*
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9. Ibid., 110.
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I Hear the Train A Comin' — Hairspray

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Hairspray was a rollicking, insightful movie back in 1988. In 2002, enterprising minds reinvigorated the property by staging a live version on Broadway. It proved a rousing success, leading to … a movie version of the stage show, currently in production. Why is this pertinent to a column covering emerging trends in scholarly communication? This past November, I had an experience **John Waters** might envy. In the overflowing Carolina ballroom at this year's **Charleston Conference**, I was able to convene the first annual "I Hear the Train A Comin' — Live" session. The plenary brought together four of the industry's leading minds with a simple goal — to tell

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